

CLAIMS:

1. An implantable medical device comprising:
a plurality of interconnected modules, each of the modules comprising a housing;
and
an overmold that at least partially encapsulates each of the housings.
2. The implantable medical device of claim 1, wherein the overmold is flexible.
3. The implantable medical device of claim 1, wherein the overmold comprises an elastomeric material.
4. The implantable medical device of claim 3, wherein the elastomeric material is silicone.
5. The implantable medical device of claim 1, wherein the overmold comprises a non-elastomeric material.
6. The implantable medical device of claim 5, wherein the non-elastomeric material is one of a polysulfone and a polyurethane.
7. The implantable medical device of claim 1, wherein the overmold comprises a first component that at least partially encapsulates each of the housings and a second component that is located adjacent to side surfaces of at least one of the housings.
8. The implantable medical device of claim 7, wherein the first component comprises an elastomeric material, and the second component comprises a non-elastomeric material.
9. The implantable medical device of claim 1, wherein the overmold includes a motion reduction element to reduce intermodule motion.

10. The implantable medical device of claim 1, further comprising a lead connection module within the overmold for connecting an external lead to electronics within one of the plurality of interconnected modules.

11. The implantable medical device of claim 1, wherein the overmold comprises a first overmold, the implantable medical device further comprising a second overmold that at least partially encapsulates a lead connection module, wherein the second overmold is tethered to the first overmold.

12. The implantable medical device of claim 1, wherein an edge of the overmold provides a sloped interface with a surface of a patient, and an angle between the edge and the surface of the patient is greater than 90 degrees.

13. The implantable medical device of claim 12, wherein the angle is within a range from 120 and 150 degrees.

14. The implantable medical device of claim 13, wherein the angle is approximately equal to 135 degrees.

15. The implantable medical device of claim 1, further comprising sloped interface element that surrounds the overmold and provides a sloped interface with a surface of a patient, and an angle between the edge and the surface of the patient is greater than 90 degrees.

16. The implantable medical device of claim 15, wherein the angle is within a range from 120 to 150 degrees.

17. The implantable medical device of claim 16, wherein the angle is approximately equal to 135 degrees.

18. The implantable medical device of claim 1, wherein the overmold is concave to conform substantially to a cranium of a patient.
19. The implantable medical device of claim 1, wherein the overmold is molded prior to implantation to conform substantially to a cranium of a patient.
20. The implantable medical device of claim 1, wherein the overmold includes durometer specific material.
21. The implantable medical device of claim 1, wherein the overmold comprises a material having a high thermal conductivity to act as a heat sink for thermal energy generated within the modules.
22. The implantable medical device of claim 1, wherein the overmold comprises a material having a low thermal conductivity to act as a shield of thermal energy generated within the modules.
23. The implantable medical device of claim 1, wherein the overmold provides external lead management for external leads being routed away from the implantable medical device.
24. The implantable medical device of claim 23, wherein the overmold includes a groove to hold external lead material.
25. The implantable medical device of claim 23, wherein the overmold includes a pouch to hold external lead material.
26. The implantable medical device of claim 1, wherein the overmold includes a removal assist structure for assisting in removal of the implantable medical device.

27. The implantable medical device of claim 1, wherein the overmold includes a through-hole to receive an attachment mechanism for attaching the implantable medical device to a patient.
28. The implantable medical device of claim 1, further comprising a radio-opaque marker within the overmold.
29. The implantable medical device of claim 1, wherein the overmold is impregnated with a therapeutic agent.
30. The implantable medical device of claim 1, wherein the implantable medical device is implanted on a cranium of a patient, and the overmold includes a cap to cover a hole within cranium.
31. The implantable medical device of claim 1, wherein at least one of the modules provides neurostimulation therapy to a patient.
32. An implantable medical device comprising:
a housing; and
an overmold that at least partially encapsulates the housing, wherein the overmold comprises a first component that at least partially encapsulates the housing and a second component that is located adjacent to side surfaces of the housing, the first component comprises elastomeric material, and the second component comprises a non-elastomeric material.
33. The implantable medical device of claim 32, wherein the overmold is flexible.
34. The implantable medical device of claim 32, wherein the elastomeric material is silicone, and the non-elastomeric material is one of a polysulfone and a polyurethane.

35. The implantable medical device of claim 32, wherein the housing comprises a housing of a first module, the implantable medical device further comprising a plurality of modules with respective housings, wherein the overmold at least partially encapsulates each of the housings and includes a motion reduction element to reduce intermodule motion.

36. The implantable medical device of claim 35, wherein the second component includes the motion reduction element.

37. The implantable medical device of claim 32, further comprising a lead connection module formed within the overmold for connecting an external lead to electronics the housing.

38. The implantable medical device of claim 32, wherein the second component forms at least a part of the lead connection module.

39. The implantable medical device of claim 32, wherein an edge of first component provides a sloped interface with a surface of a patient, and an angle between the edge and the surface of the patient is greater than 90 degrees.

40. The implantable medical device of claim 39, wherein the angle is within a range from 120 and 150 degrees.

41. The implantable medical device of claim 40, wherein the angle is approximately equal to 135 degrees.

42. The implantable medical device of claim 32, further comprising sloped interface element that surrounds the overmold and provides a sloped interface with a surface of a patient, and an angle between the edge and the surface of the patient is greater than 90 degrees.

43. The implantable medical device of claim 32, wherein at least one of the first and second components of the overmold is concave such that the overmold conforms substantially to a cranium of a patient.
44. The implantable medical device of claim 32, wherein at least one of the first and second materials includes a through-hole to receive an attachment mechanism for attaching the implantable medical device to a patient.
45. The implantable medical device of claim 32, wherein implantable medical device provides neurostimulation therapy to a patient.
46. The implantable medical device of claim 32, wherein the housing comprises a housing of a first module, the implantable medical device further comprising a plurality of interconnected modules, each module including a respective housing, wherein the overmold at least partially encapsulates each of the housings.
47. An implantable medical device, comprising:
a plurality of interconnected modules, each of the modules comprising a housing;
and
means for integrating the modules into a single structure that at least partially encapsulates each of the housings.
48. The implantable medical device of claim 47, wherein the means for integrating is flexible.
49. The implantable medical device of claim 47, wherein the means for integrating comprises a means for providing flexibility for the implantable medical device and a means for providing structural integrity for the implantable medical device.
50. The implantable medical device of claim 47, wherein the means for integrating comprises means for reducing intermodule motion.

51. The implantable medical device of claim 47, wherein the means for integrating comprises means for connecting an external lead to electronics within one of the plurality of interconnected modules.

52. The implantable medical device of claim 47, wherein the means for integrating provides a sloped interface with a surface of a patient.

53. The implantable medical device of claim 47, wherein the means for integrating comprises means for holding external lead material.

54. The implantable medical device of claim 47, wherein the means for integrating comprises means for facilitating removal of the implantable medical device.

55. The implantable medical device of claim 47, wherein the means for integrating means for receiving an attachment mechanism for attaching the implantable medical device to a patient.

56. A motion for fabricating a modular implantable medical device having an overmold, the method comprising:
 fabricating an overmold;
 fabricating a plurality of modules with their respective interconnection member;
 fabricating a motion reduction element; and
 combining the overmold, motion reduction element and plurality of modules to construct the modular implantable medical device.

57. The method according to claim 56, wherein the fabricating an overmold comprises:
- fabricating a first component;
 - fabricating a second component; and
 - coupling the first and second components together to form the overmold.
58. The method according to claim 56, wherein the first component comprises a solid biocompatible elastomeric material that is soft and flexible.
59. The method according to claim 57, wherein the second component comprises a non-elastomeric components formed of a non-elastomeric material.
60. The method according to claim 58, wherein the elastomeric component provides an overall shape and flexibility of modular implantable medical device.
61. The method according to claim 59, wherein the non-elastomeric component provides structural integrity for modular implantable medical device.